

FIG. 1

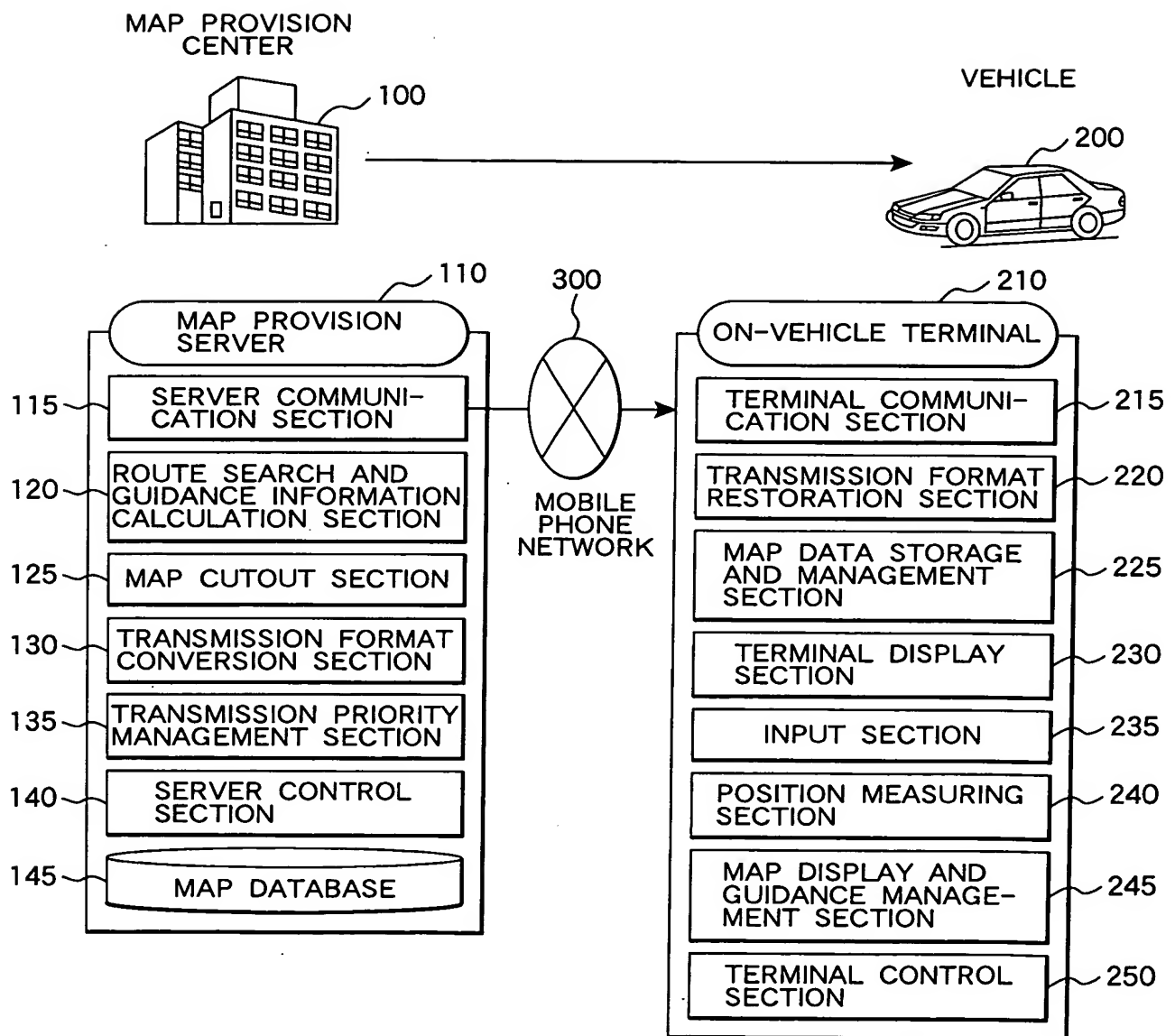


FIG. 2

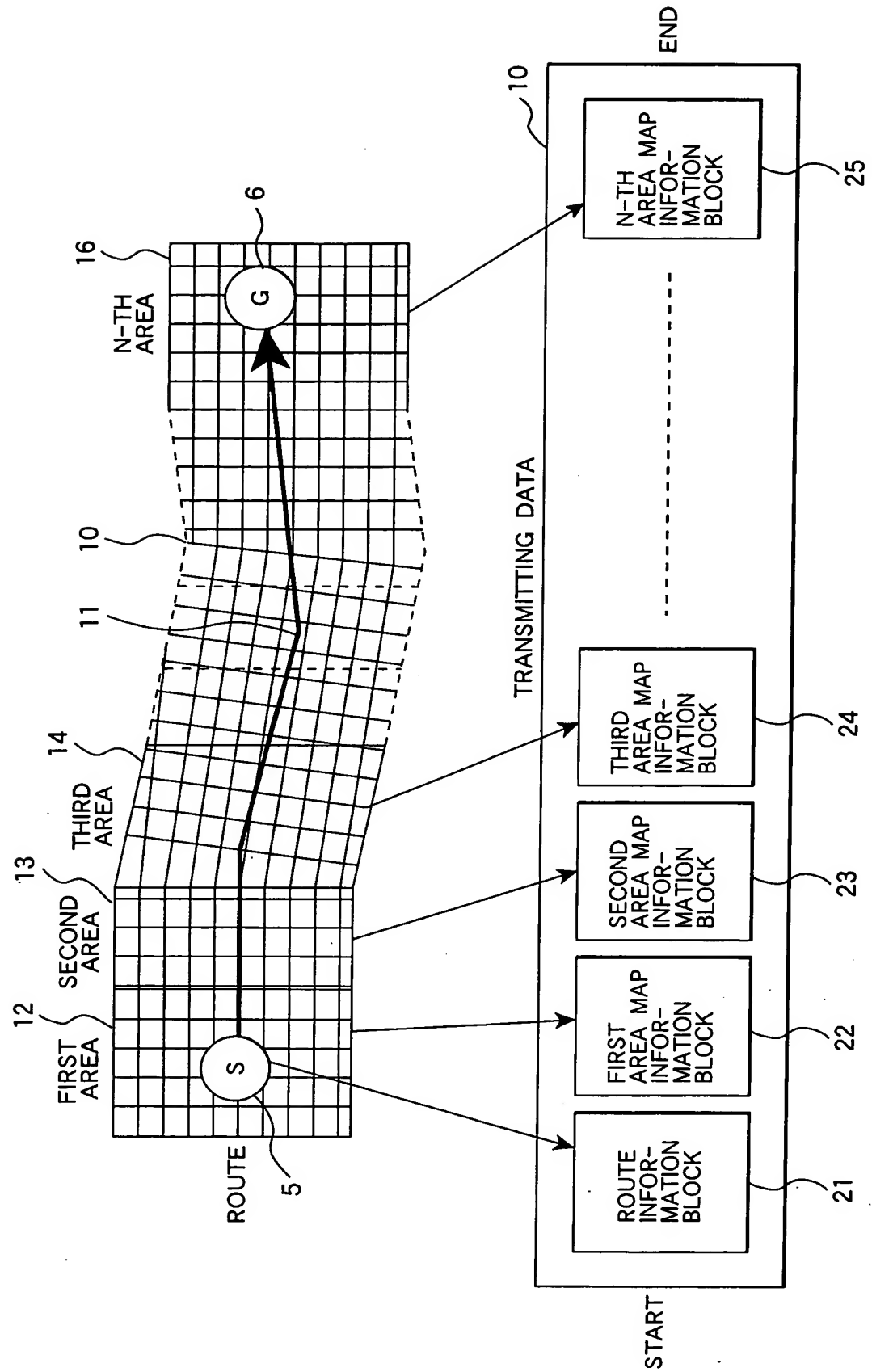


FIG. 3

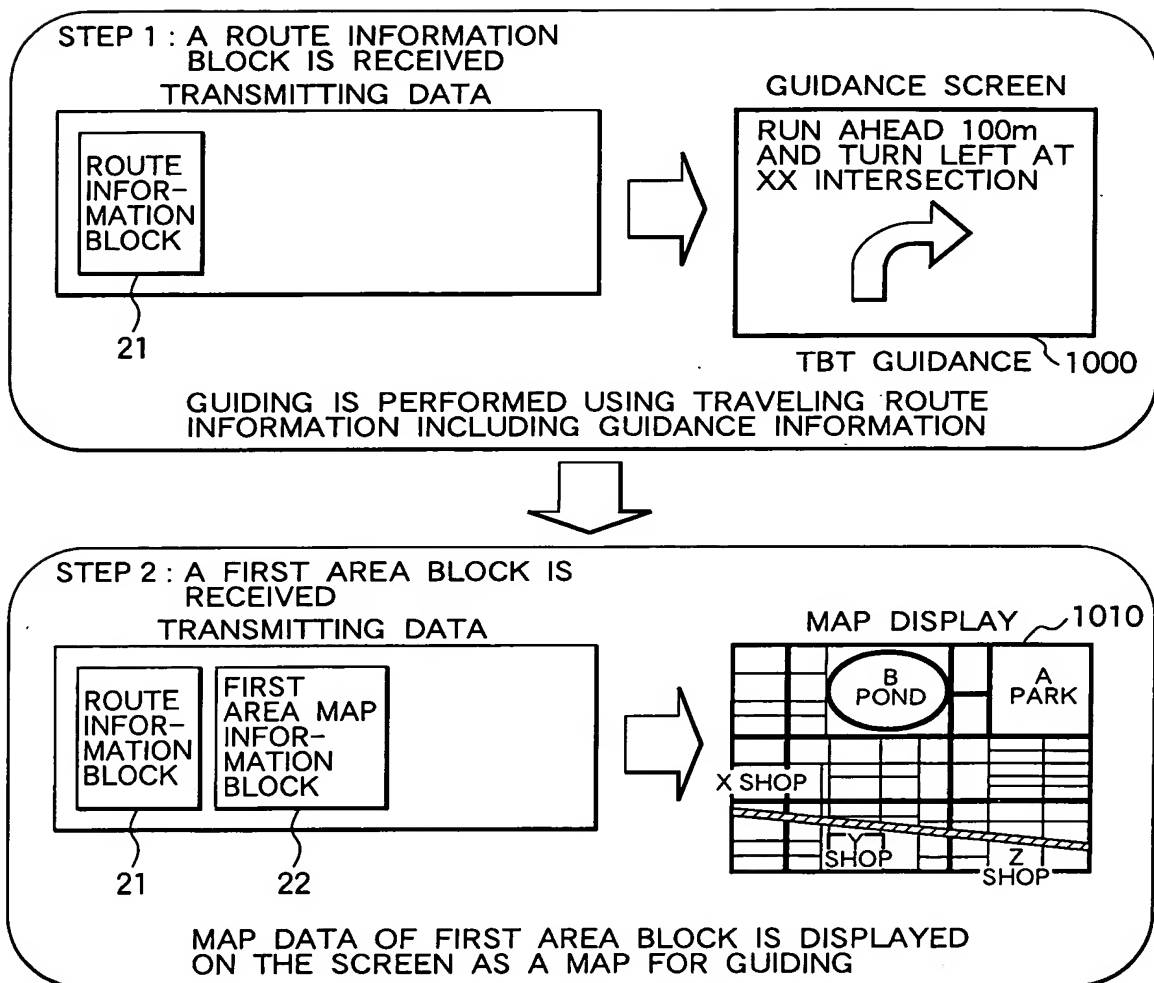


FIG. 4

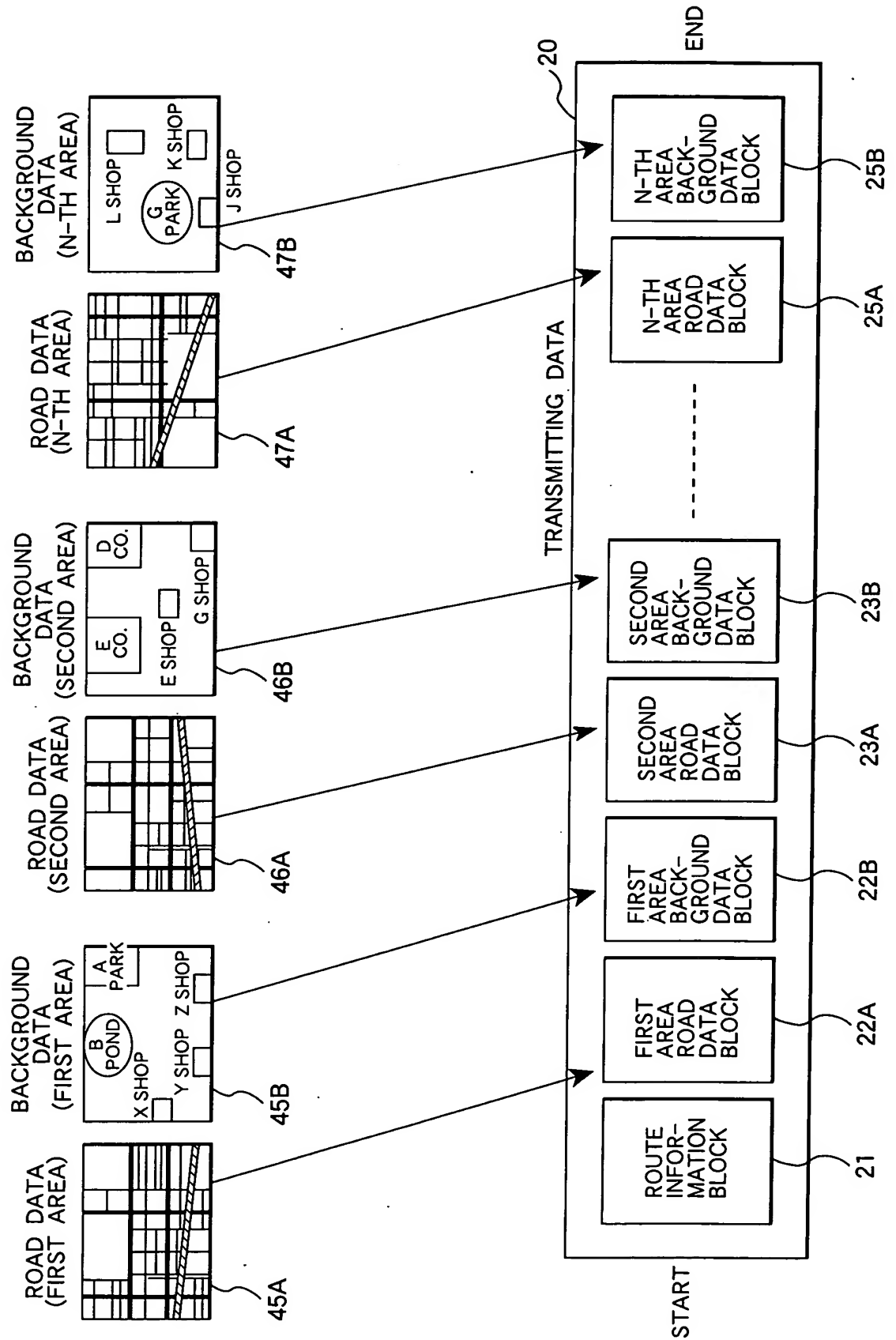


FIG. 5

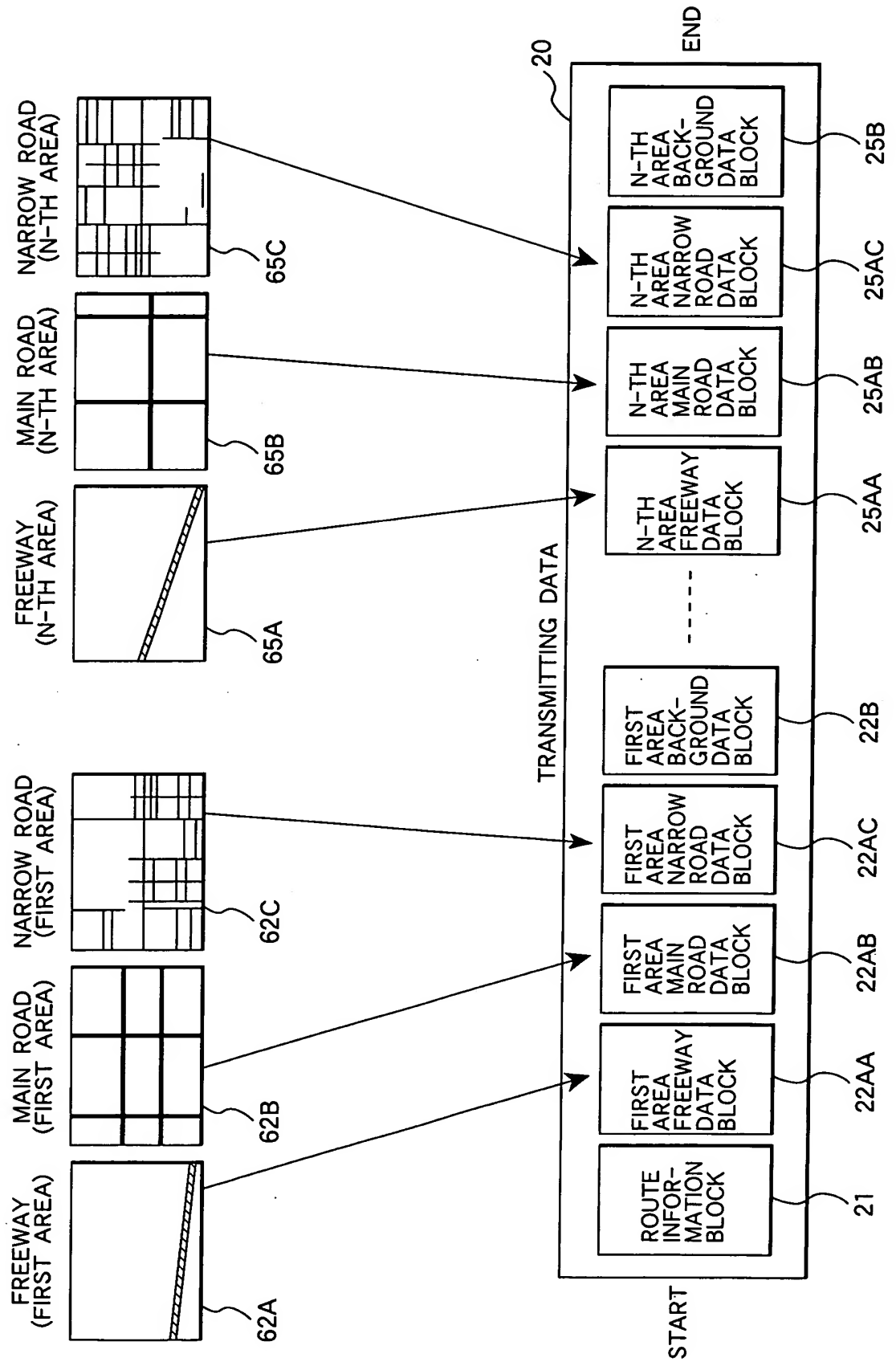
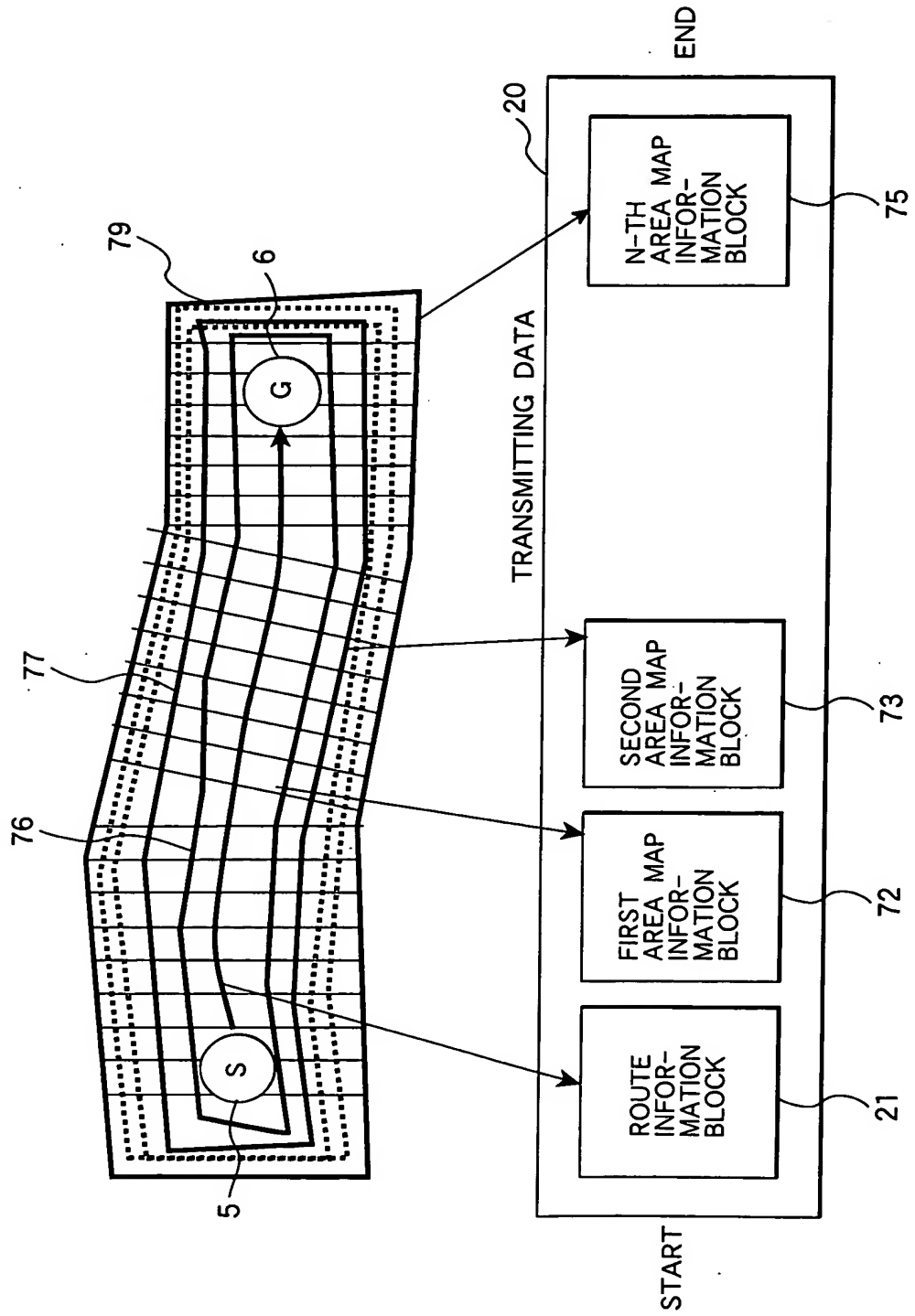


FIG. 6



7/31

FIG. 7

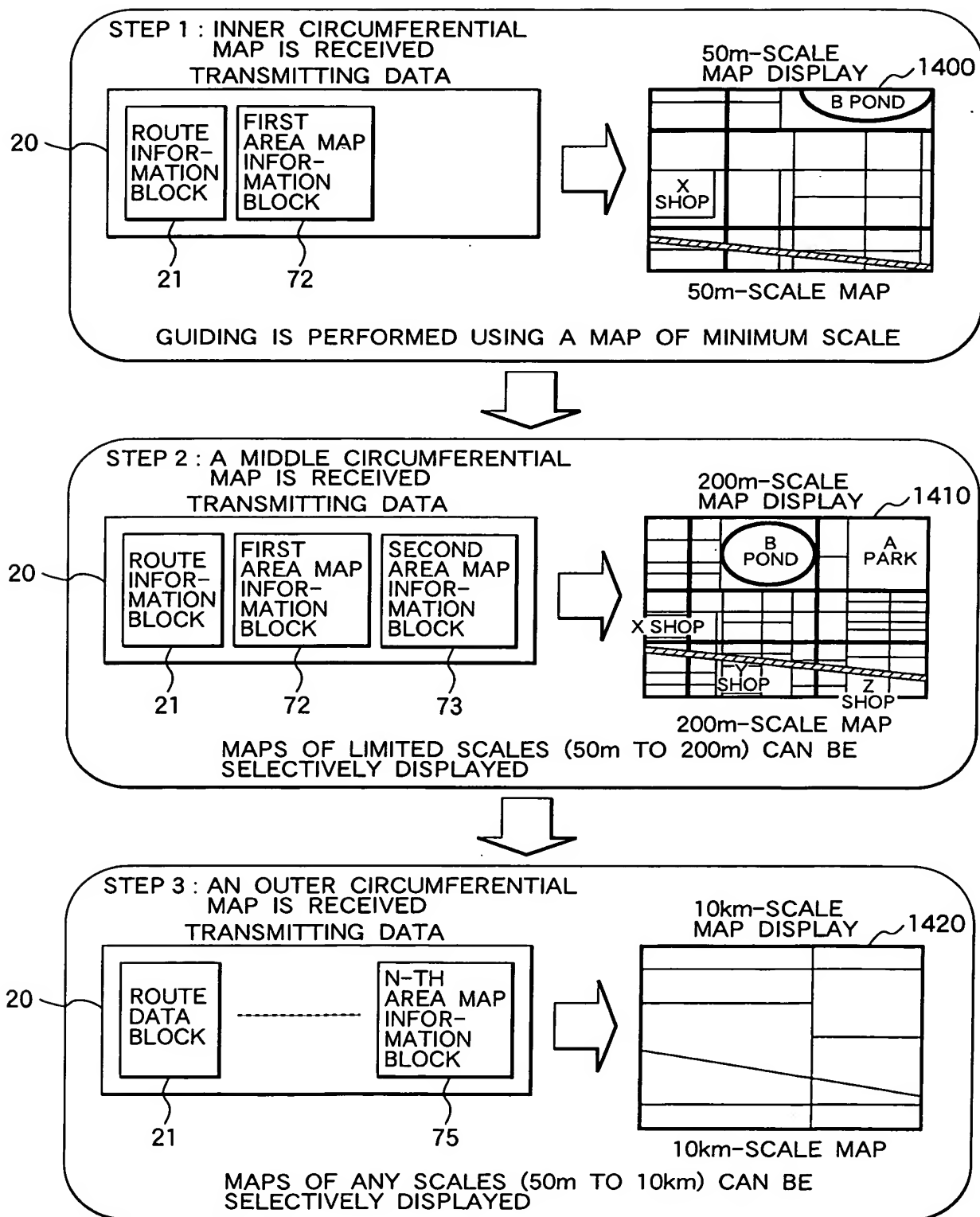


FIG. 8

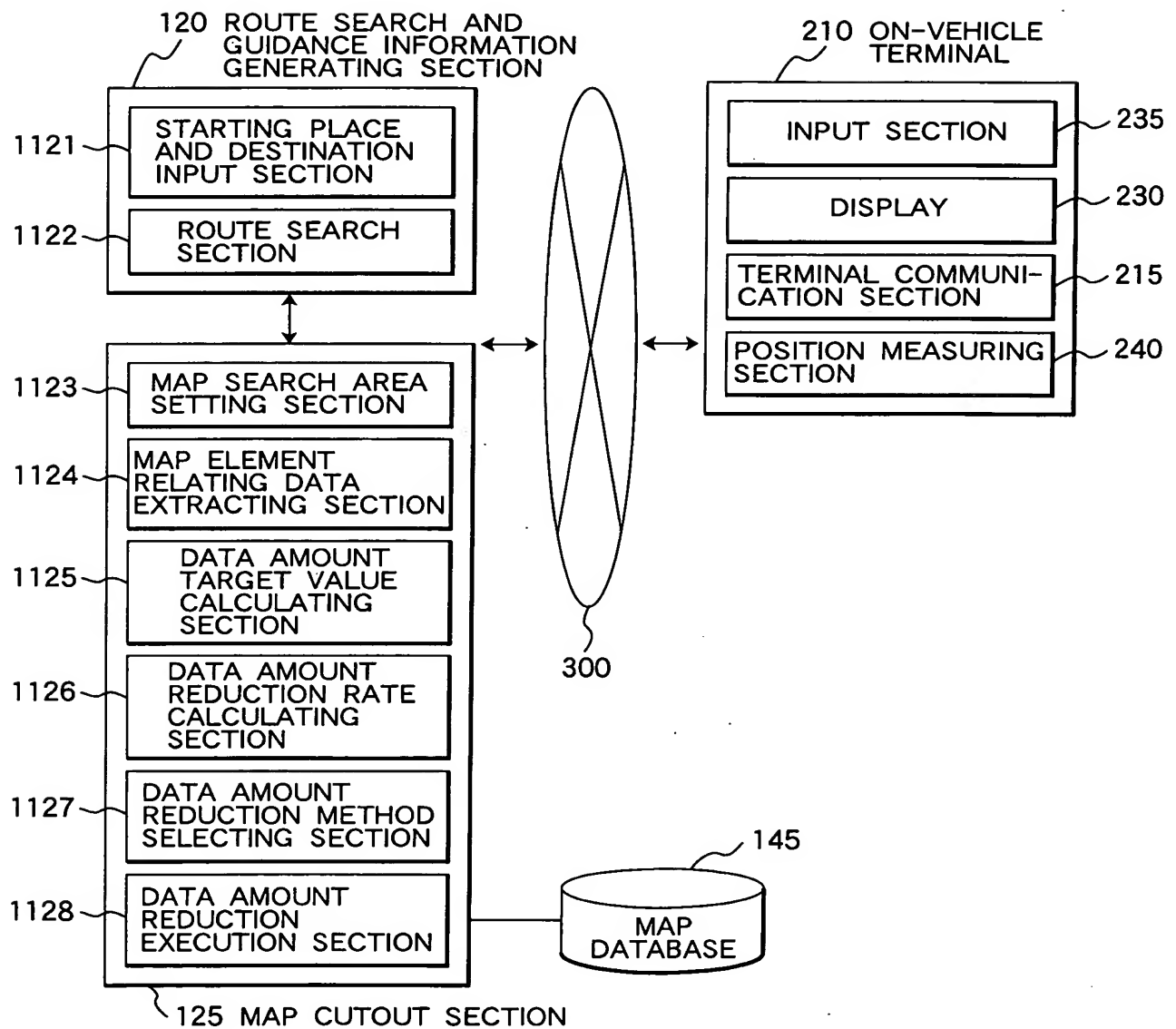


FIG. 9

MAP DATABASE TABLE

ID	LAYER	CATEGORY	FIGURE TYPE	FIGURE DATA	NAME
2001	200	10	polyline	{{(x1, y1), ..., (xn, yn)}}	"CHUO LINE"
3002	300	20	polygon	{{(x1, y1), ..., (xn, yn)}}	"GREEN PARK"
1003	100	20	polyline	{{(x1, y1), ..., (xn, yn)}}	"ROUTE 16"
4004	400	10	point	(x1, y1)	"XX BANK"
⋮	⋮	⋮	⋮	⋮	⋮

LAYER TABLE

LAYER	CATEGORY TABLE NAME
100	ROAD
200	RAILWAY
300	FIELD
400	LANDMARK
⋮	⋮

ROAD CATEGORY TABLE

CATEGORY	CONTENT
10	EXPRESSWAY
20	NATIONAL ROAD
30	PREFECTURAL ROAD
40	REGULAR ROAD
⋮	⋮

RAILWAY CATEGORY TABLE

CATEGORY	CONTENT
10	JR
20	PRIVATE RAILWAY
30	SUBWAY
40	MONORAIL
⋮	⋮

FIELD CATEGORY TABLE

CATEGORY	CONTENT
10	WATERS
20	PARK
30	SEA
40	OTHERS
⋮	⋮

LANDMARK CATEGORY TABLE

CATEGORY	CONTENT
10	BANK
20	RESTAURANT
30	DEPARTMENT STORE
40	FAST FOOD
⋮	⋮

FIG. 10

401

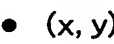
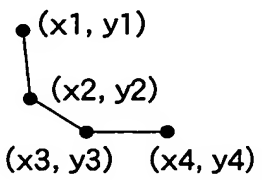
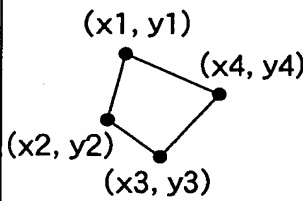
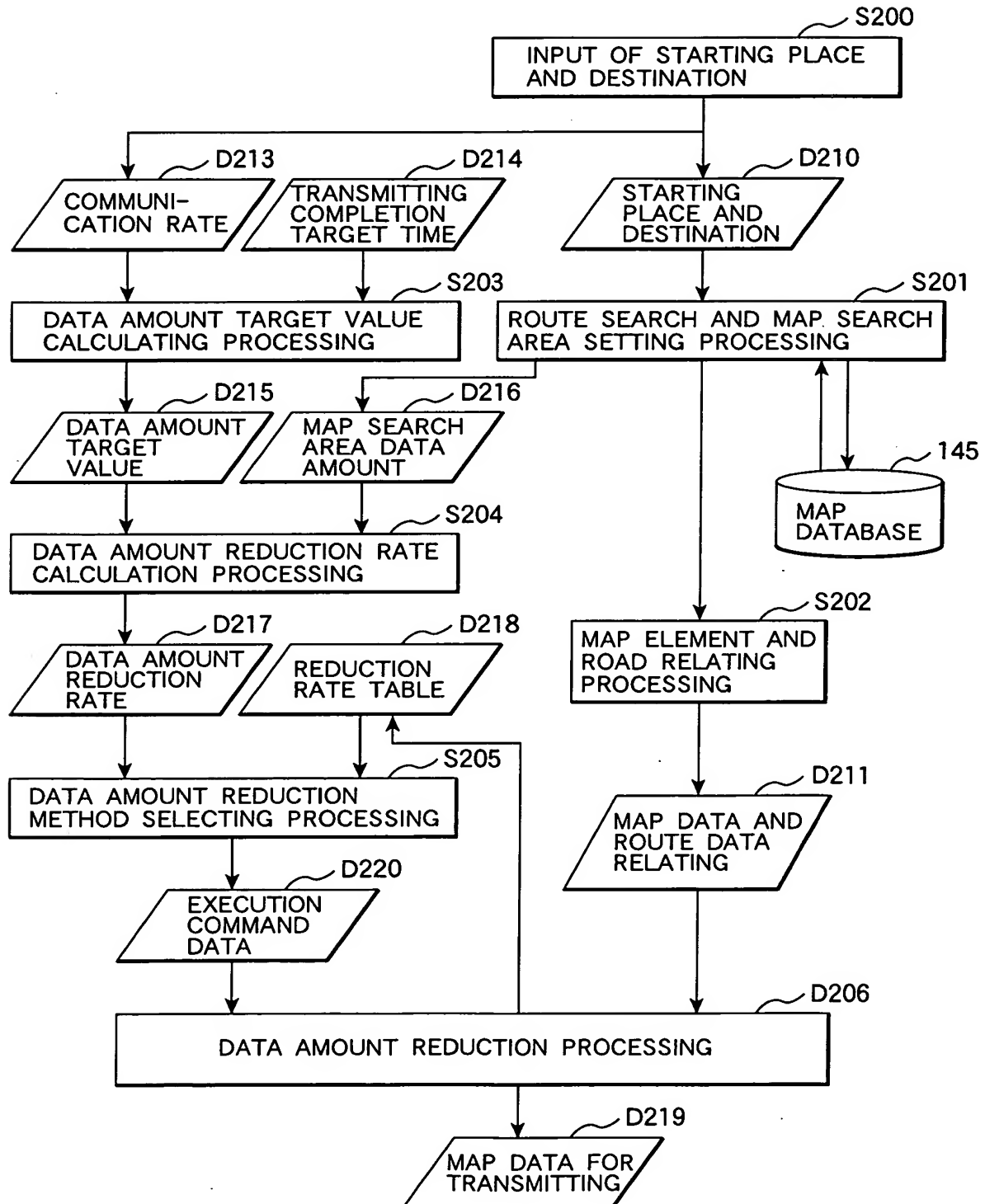
FIGURE TYPE	EXAMPLE OF FIGURE DATA	STORAGE FORM
point		(x, y)
polyline		$\{(x1, y1), (x2, y2), (x3, y3), (x4, y4)\}$
polygon		$\{(x1, y1), (x2, y2), (x3, y3), (x4, y4)\}$

FIG. 11



12/31

FIG. 12

ROUTE SEARCH AND MAP SEARCH AREA SETTING

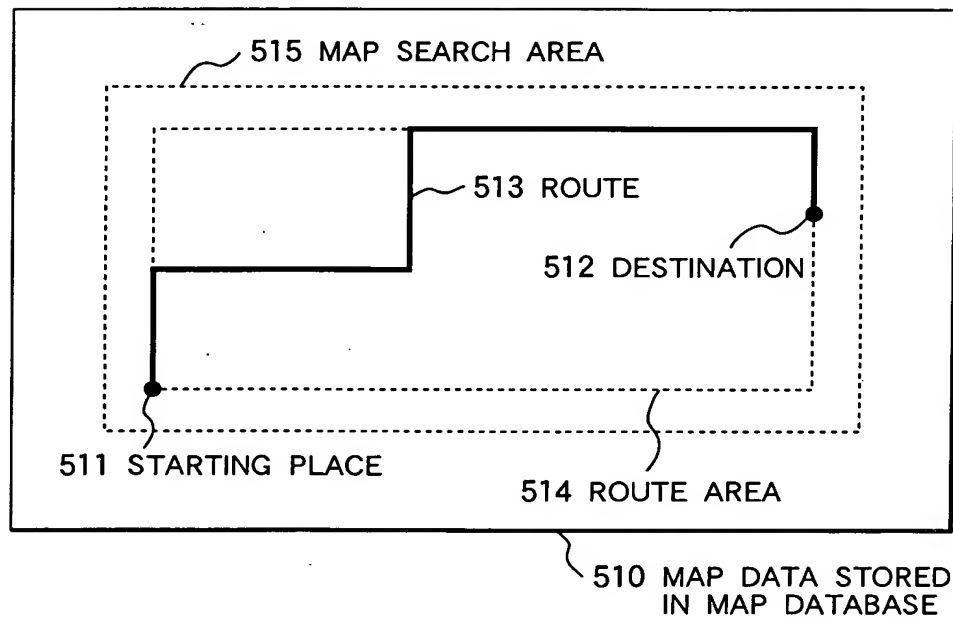
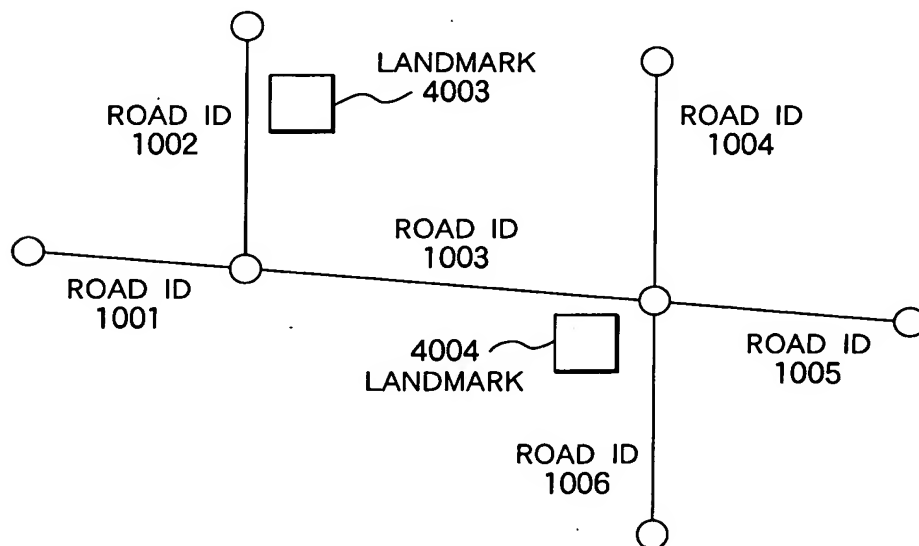


FIG. 13

RELATING LANDMAK FIGURES AND ROADS

ID	LAYER	CATEGORY	FIGURE TYPE	FIGURE DATA	NAME	ADJACENT ROAD
4003	400	20	point	(x1, y1)	" "	{1002}
4004	400	10	point	(x1, y1)	"XX BANK"	{1003, 1006}
⋮	⋮	⋮	⋮	⋮	⋮	⋮



ADJACENT ROAD IDS ARE FOUND AND RELATED IN
UNITS OF FIGURES

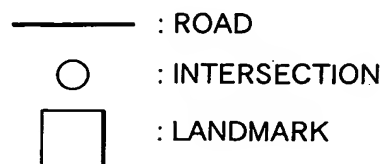
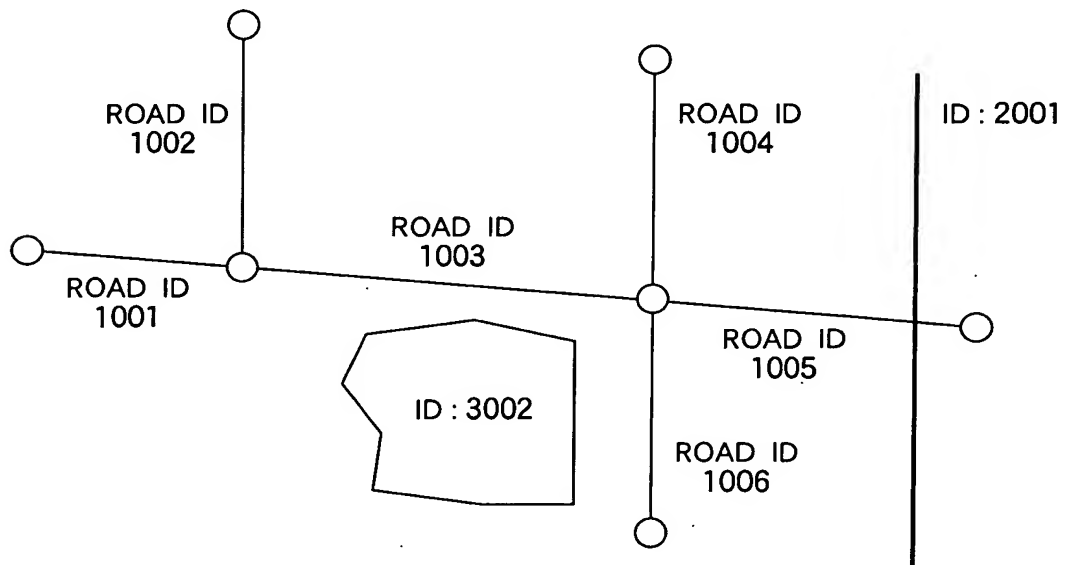


FIG. 14

RELATING BACKGROUND FIGURES AND ROADS 301

ID	LAYER	CATEGORY	FIGURE TYPE	FIGURE DATA	NAME	ADJACENT ROAD
2001	200	10	polyline	{{(x1, y1), ...}}	"CHUO LINE"	{1002}
3002	300	20	polyline	{{(x1, y1), ...}}	"GREEN PARK "	{1003, 1006}
⋮	⋮	⋮	⋮	⋮	⋮	⋮



ADJACENT OR INTERSECTING ROAD IDS ARE FOUND
AND RELATED IN UNITS OF FIGURES

FIG. 15

REDUCTION RATE TABLE

803

DATA REDUCTION METHOD NAME	PARAMETER SET	REDUCTION RATE (%)
ROAD/BACKGROUND/LANDMARK FIGURE SELECTING 1	a	80
ROAD/BACKGROUND/LANDMARK FIGURE SELECTING 2	b	60
ROAD/BACKGROUND/LANDMARK FIGURE SELECTING 3	c	40
FIRST POLYLINE FIGURE LINEARIZING PROCESSING	FIXED	5
POLYLINE FIGURE INTEGRATING PROCESSING	FIXED	15
⋮	⋮	⋮

804

PARAMETER TYPE OF ROAD FIGURE SELECTING PROCESSING

- a: ONLY ROUTES AND ROUTE MINOR ROADS INTERSECTING WITH THE ROUTES ARE SELECTED
- b: ONLY ROUTES, MAIN ROADS, AND ROUTE MINOR ROADS ARE SELECTED
- c: ROUTES, MAIN ROADS, AND ROUTE MINORS, AND STRAIGHT CONNECTING ROADS ARE SELECTED

FIG. 16

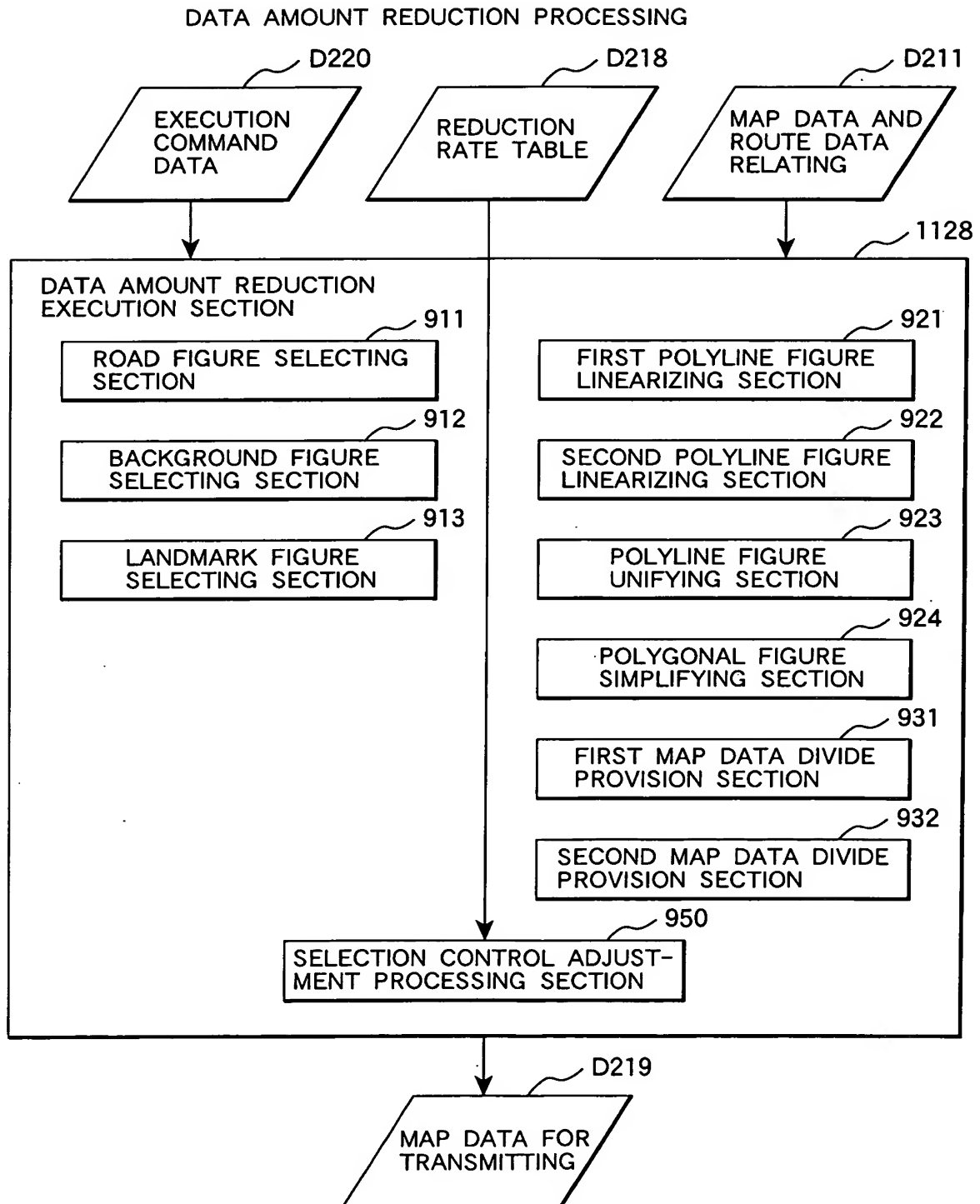


FIG. 17

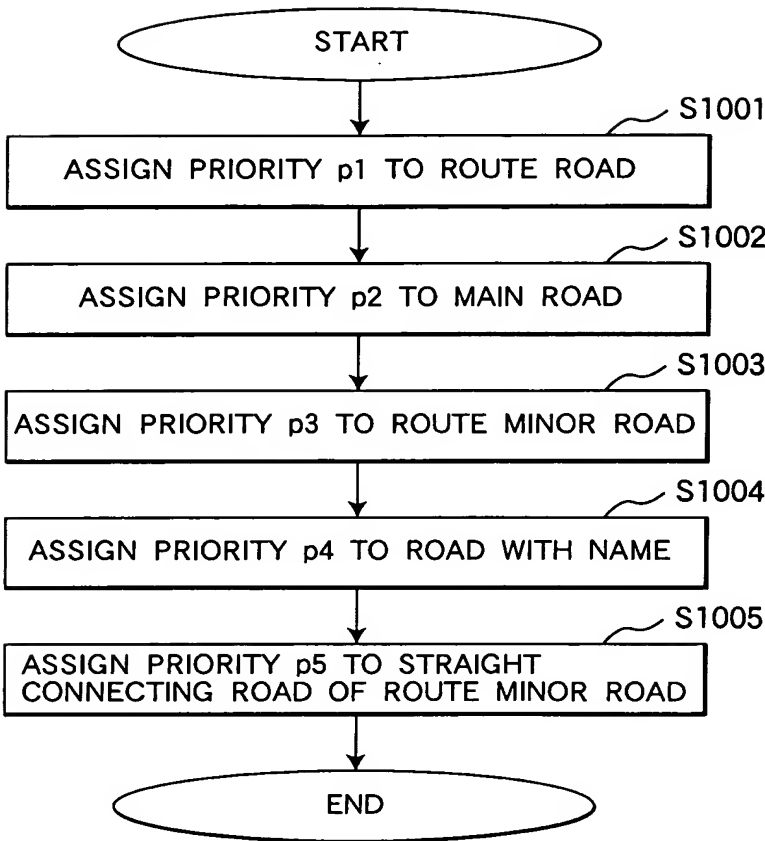


FIG. 18

ROAD DATA WITH PRIORITY							301	1010
ID	LAYER	CATEGORY	FIGURE TYPE	FIGURE DATA	NAME	PRI-ORITY		
1001	100	50	polyline	{{(x1, y1), ..., (xn, yn)}}		p1		
1002	100	20	polyline	{{(x1, y1), ..., (xn, yn)}}	{{(name, "ROUTE 20")}}	p2		
1003	100	20	polyline	{{(x1, y1), ..., (xn, yn)}}	{{(name, "ROUTE 16")}}	p3		
1004	100	40	polyline	{{(x1, y1), ..., (xn, yn)}}	{{(name, "FUCHU ROAD")}}	p4		
⋮	⋮	⋮	⋮	⋮	⋮	⋮		

FIG. 19A



FIG. 19B

ROUTE

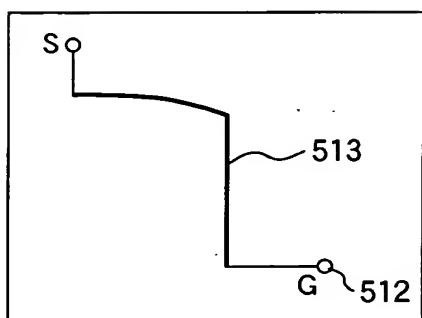


FIG. 19C

ROUTE AND MINOR

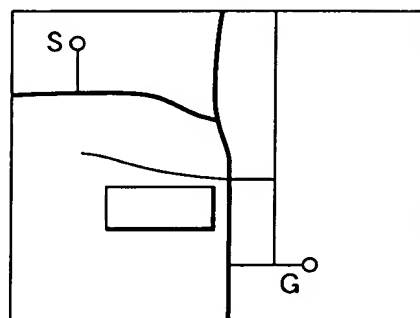


FIG. 19D

ROUTE AND MAIN ROAD
AND MINOR

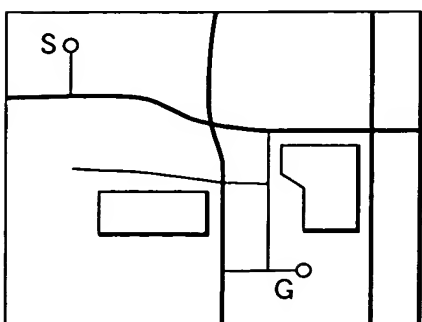
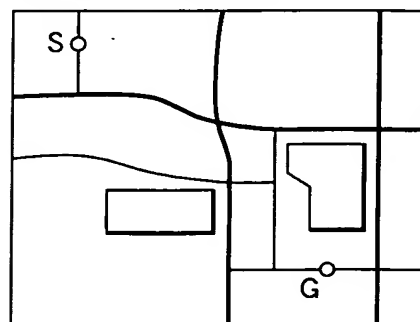


FIG. 19E

ROUTE AND MAIN ROAD AND
MINOR AND MINOR STRAIGHT
CONNECTING ROAD



19/31

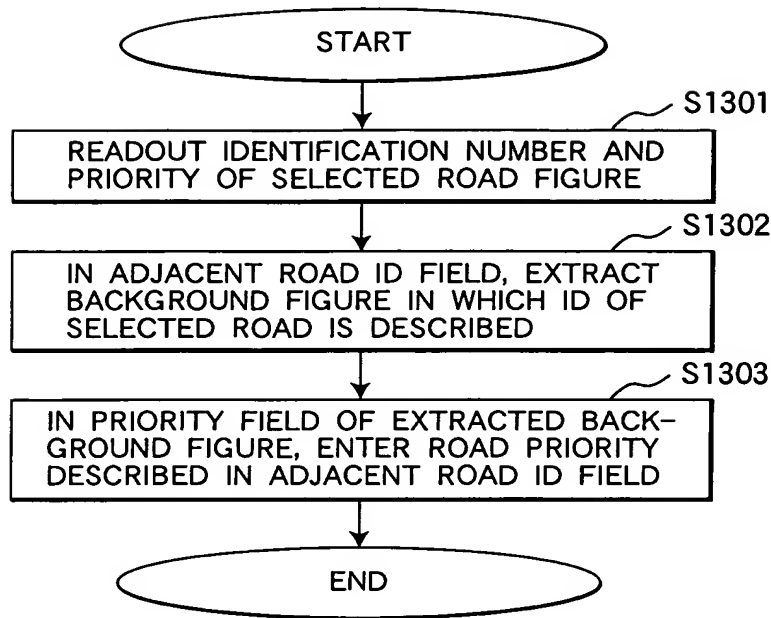
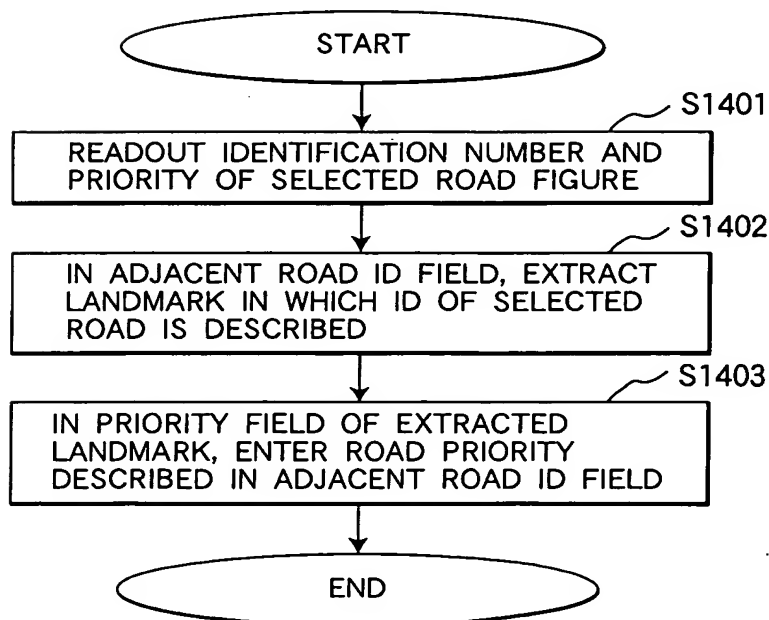
FIG. 20**FIG. 21**

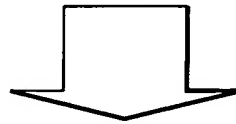
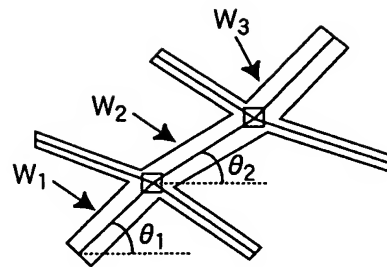
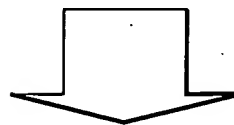
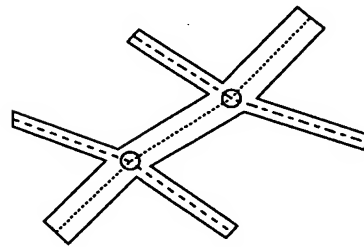
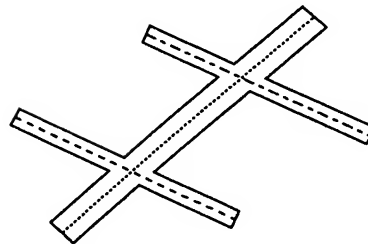
FIG. 22A**FIG. 22B****FIG. 22C**

FIG. 23A FIG. 23B FIG. 23C FIG. 23D FIG. 23E

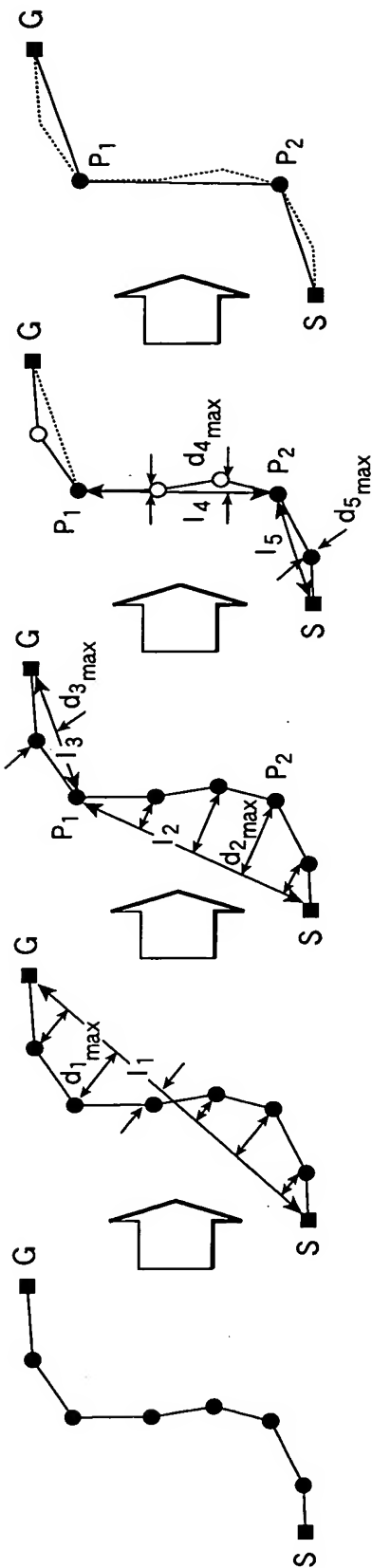


FIG. 24

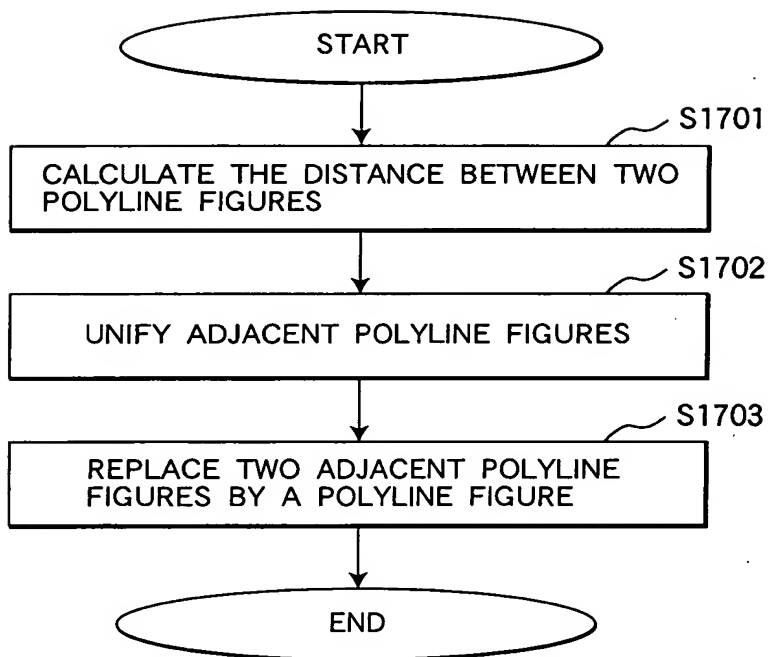


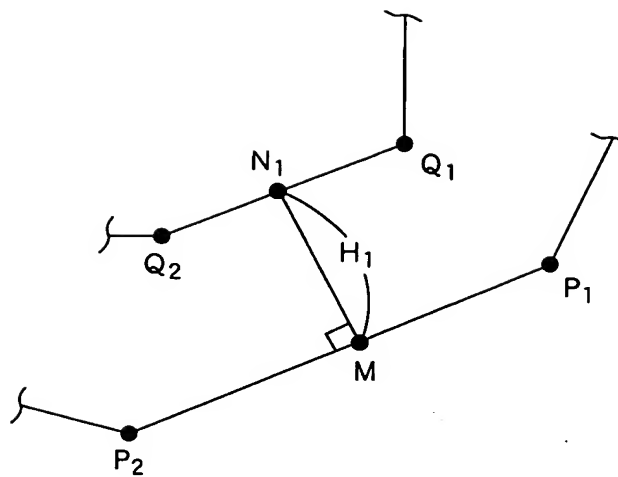
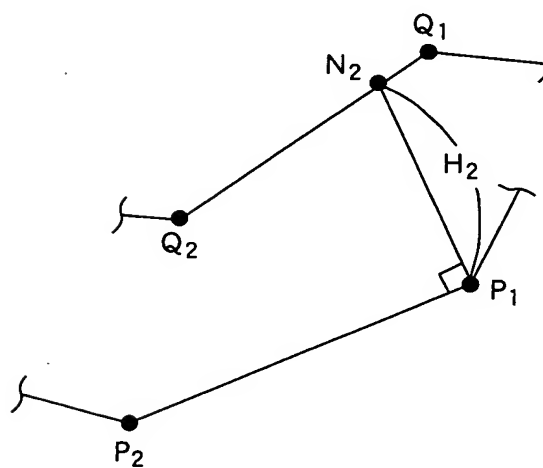
FIG. 25A**FIG. 25B**

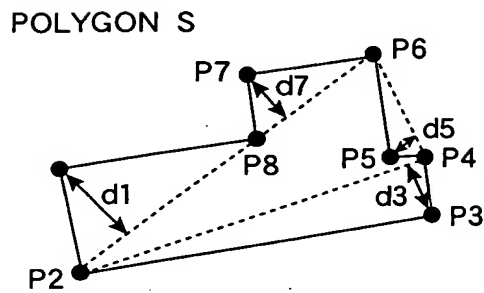
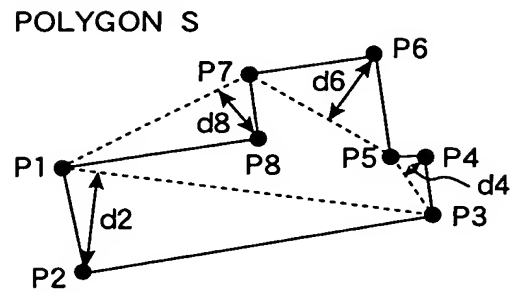
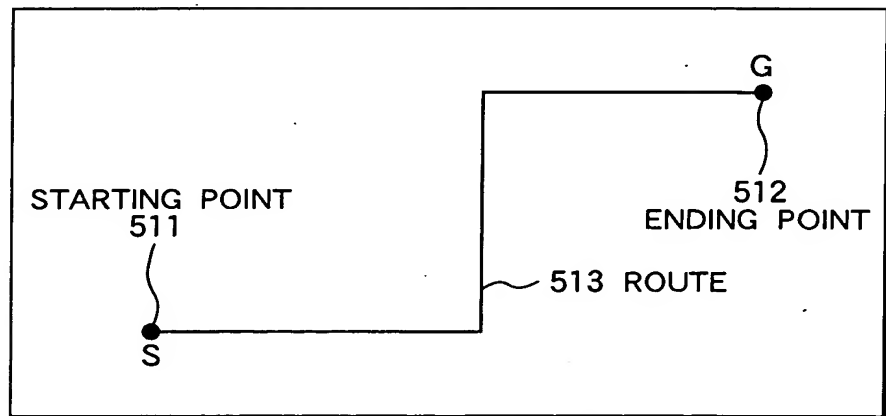
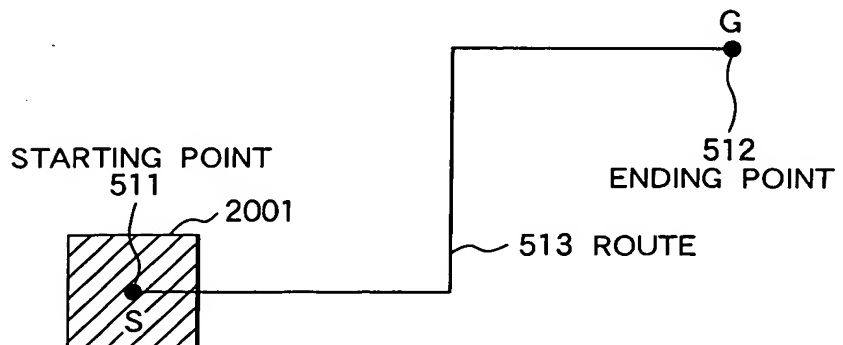
FIG. 26A**FIG. 26B****FIG. 27A****FIG. 27B**

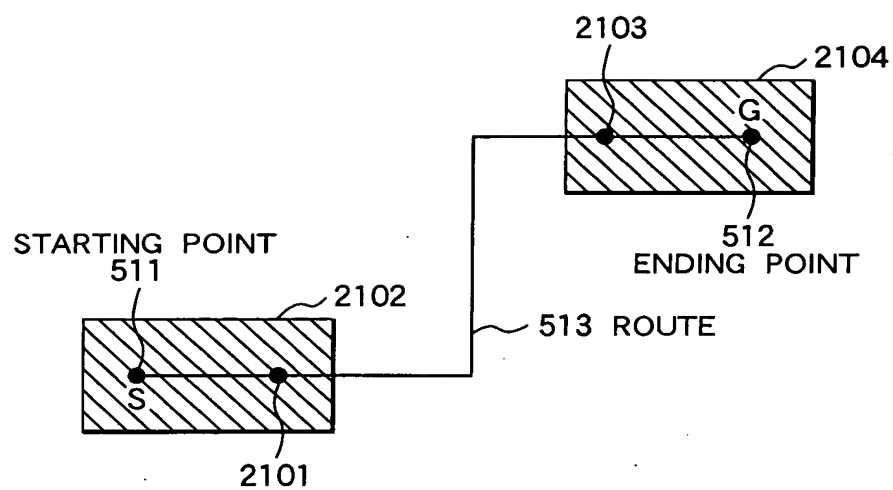
FIG. 28

FIG. 29A

ROUTE LINK TRAIN DATA	
ROUTE ID	
TRANSMISSION DATA SIZE	
MESH ID (A4)	MESH A4
ROUTE LINK TRAIN (LL001)	
ROUTE LINK TRAIN (LL002)	
⋮	
MESH ID (B4)	MESH B4
ROUTE LINK TRAIN	
⋮	
MESH ID (B3)	MESH B3
ROUTE LINK TRAIN	
⋮	
MESH ID (C3)	MESH C3
ROUTE LINK TRAIN	
⋮	
MESH ID (C2)	MESH C2
ROUTE LINK TRAIN	
⋮	
MESH ID (C1)	MESH C1
ROUTE LINK TRAIN	
⋮	
ROUTE LINK TRAIN (LL021)	

FIG. 29B

MAP DATA	
ROUTE ID	
TRANSMISSION DATA SIZE	
MESH ID (A4)	MESH A4
ROAD DATA	
BACKGROUND DATA	
NAME DATA	
	MESH B4
	MESH A3
	MESH B3
	MESH C4
	MESH C3
	MESH B2
	MESH C2
	MESH B1
	MESH C1

FIG. 30

MAP MANAGEMENT TABLE

1014

ROUTE ID	1
ROUTE LINK TRAIN ID	MESH ID
LL001	A4, A3
LL002	A4, A3
	⋮
LL018	B3, B2, C3, C2
LL019	B2, B1, C2, C1
	⋮

ROUTE ID	2
ROUTE LINK TRAIN ID	MESH ID
LL001	A4, A3
LL002	A4, A3
	⋮
LL063	C2
LL064	C2
	⋮

TABLE FOR
MESHERS

⋮

MESH DATA TABLE

MESH ID	ROUTE ID	ROUTE LINK TRAIN ID	MESH DATA NAME
A4	1, 2	LL001	A4_20030123
B4	1, 2	LL001	B4_20030123
	⋮		
B2	1, 2	LL018, LL019	B2_20030123
C2	1	LL018, LL019	C2_20030205
C2	2	LL018, LL063, LL064	C2_20030205
	⋮		

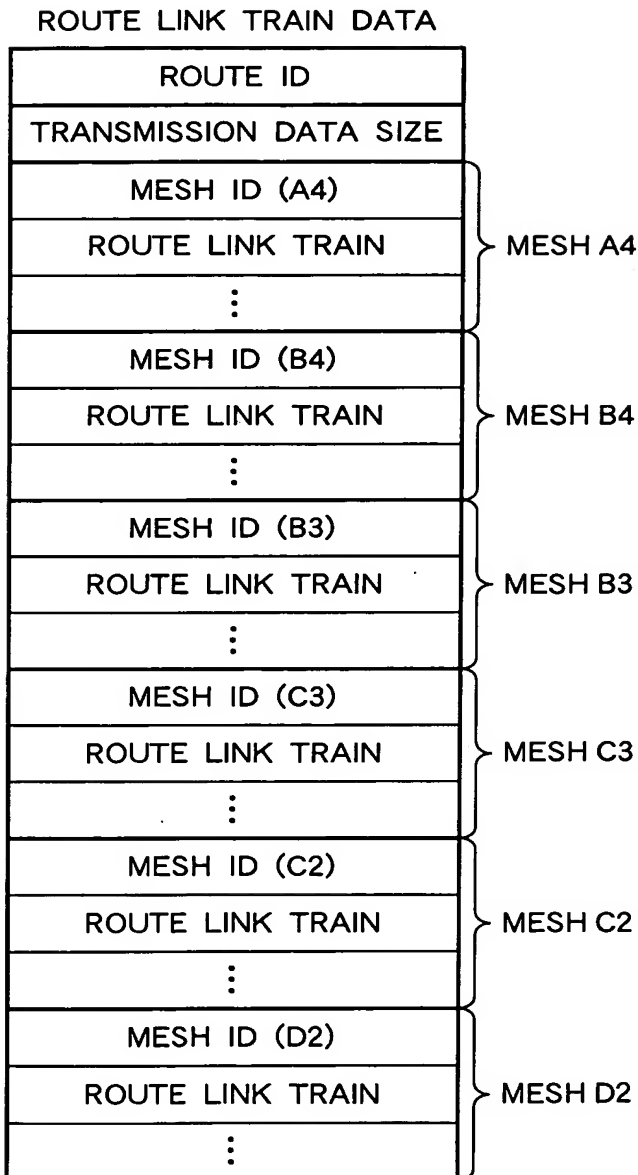
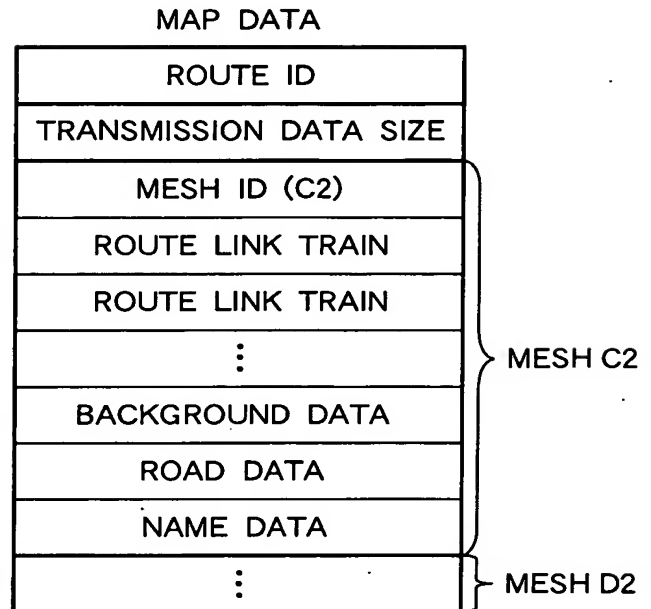
FIG. 31A**FIG. 31B**

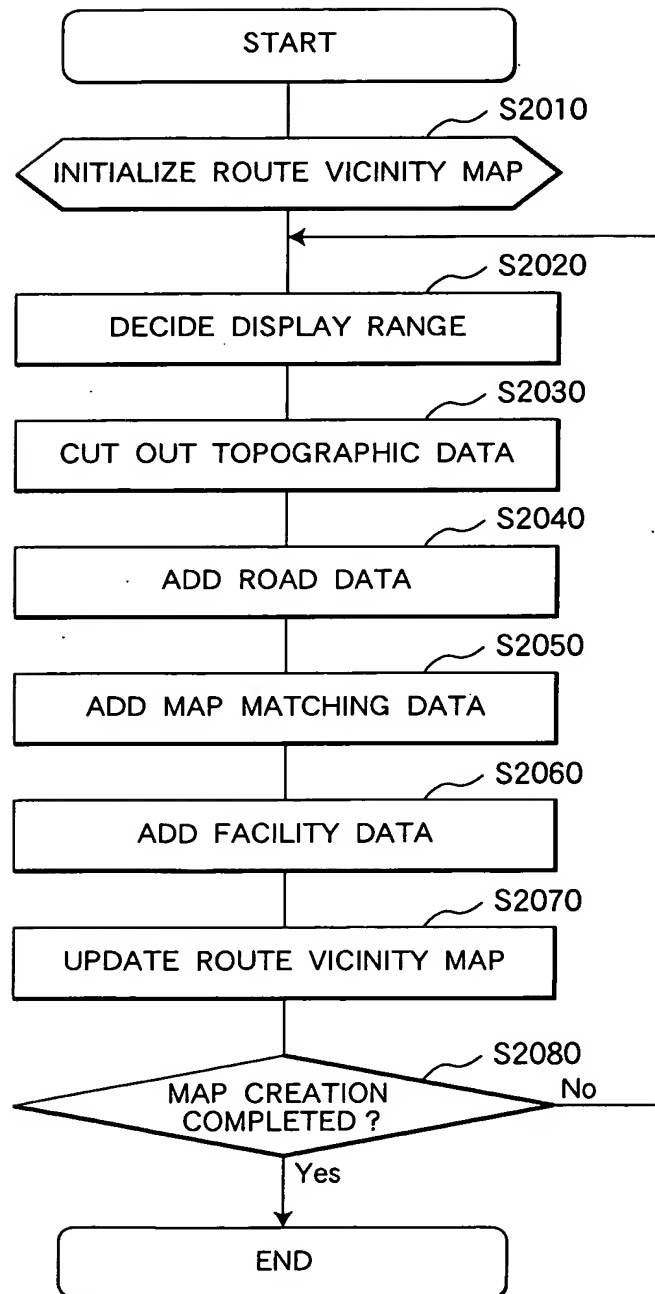
FIG. 32

FIG. 33

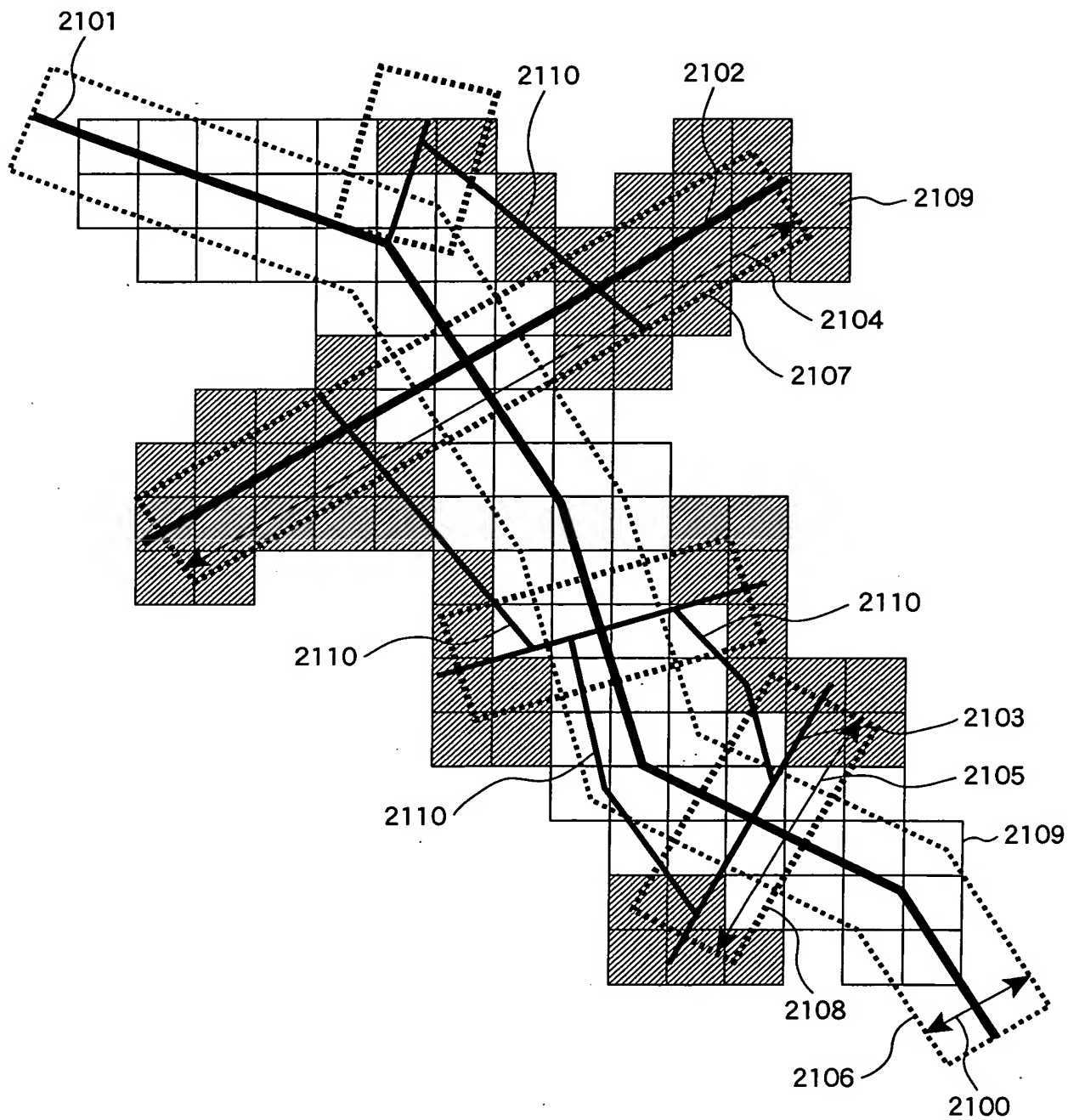


FIG. 34

